

## ORIGINAL RESEARCH

# Management of acute diarrhoea among children aged 6 - 59 months admitted at Juba Teaching Hospital

Alice J Stephen<sup>a</sup>, F.V. Murila<sup>b</sup> and Dalton Wamalwa<sup>c</sup>

a. University of Nairobi and Department of Paediatrics, Juba Teaching Hospital

b. Senior Lecturer, Neonatologist, Department of Paediatrics and Child Health, University of Nairobi

c. Associate professor, Paediatric, Department of Paediatrics and Child Health, University of Nairobi

Correspondence to: Alice J Stephen [alice.lako@yahoo.com](mailto:alice.lako@yahoo.com)

**INTRODUCTION:** Diarrhoea is a leading cause of mortality and morbidity in children under five worldwide and accounts for 42.9% of under-5 mortality in South Sudan. Clinical outcomes for diarrhoea correlate with the quality of hospital care.

**METHODOLOGY:** The standard WHO/IMCI for assessment of health workers' performance in the management of illnesses in children under 5 years was adapted and used in the study. Questionnaires and interviews were used to collect data on health workers' knowledge and practice in the management of acute diarrhoea. Descriptive analysis was used to determine the means, frequencies and proportions of the variables.

**RESULTS:** Thirty nine health workers were interviewed and 202 medical records of children admitted with acute diarrhoea between March and June 2014 were examined. The majority (75.74%) of the children were 6-24 months old. Most assessments were incomplete; the commonest sign assessed was sunken eyes (75.12%) and the least assessed was ability to drink/breastfeed (34.32%). Seventy five percent of patients were classified correctly according to WHO guidelines and 61% of health workers administered fluid therapy correctly. Health workers' knowledge of how to assess the hydration state was poor (below 50%).

**CONCLUSION:** There was inadequate assessment and documentation of the signs and symptoms of dehydration and inappropriate use of rehydration fluid therapy in the children admitted with acute watery diarrhoea. Regular in-house training and feedback and provision of supplies should be given to the clinicians in order to improve the quality of care.

*Key words: acute diarrhoea, assessment, South Sudan*

## Introduction

Most deaths of children under 5 years old are due to conditions that can be prevented or treated with access to simple, affordable interventions. The leading causes of death are pneumonia, diarrhoea and malnutrition [1]. The quality of care provided in low-income countries is often poor. More than half of the diarrhoea cases are complicated by malnutrition. The World Health Organization (WHO) has guidelines for treating diarrhoea [2].

Diarrhoea has remained among the top five causes of mortality and morbidity in South Sudan, particularly in infants and children aged below five years – among whom the death rate is 104/1000 live births. The prevalence of diarrhoea among children aged under five years is 42.9% in South Sudan [3], compared to Kenya where it is 17.0% [4].

The government of South Sudan introduced the

Integrated Management of Childhood Illness (IMCI) in 2007 included in the basic package of health and nutrition services [5]. However, only four out of 10 counties are implementing this strategy to some degree, mainly concentrating on improving case management skills and health care delivery systems. With funding from WHO, UNICEF and other partners, training has been provided for health workers but is reaching some counties only partially. Overall the implementation of the IMCI strategy is inadequate [6].

Therefore, the primary objectives are:

- To determine the proportion of children aged 6-59 months with acute diarrhoea at JTH who are assessed for clinical signs of dehydration and classified
- To determine the proportion of children aged 6-59 months with acute diarrhoea correctly prescribed IV fluids and/or ORS for the management of dehydration as per WHO guidelines

The secondary objectives are:

- To describe the knowledge of health workers with regards to the assessment and classification of diarrhoea and the clinical indications of rehydration fluids in the management of children with acute diarrhoea.
- To describe the views of health workers on availability of commodities necessary for management of acute diarrhoea.

## Methodology

The study was cross-sectional with two parts:

1. A hospital based retrospective audit of records of children aged 6-59 months admitted with acute diarrhoea at JTH between March and June 2014, and
2. Interviews of health workers assessing their knowledge on the management of acute diarrhoea in children aged 6-59 months.

Using the Fisher formula  $n = (Z^2 \times p \times (1-p)) / d^2$

the sample size of 170 was estimated for the audit files.  $Z$  = critical value at 1.96,  $P$  = proportion of records to be 50%,  $d$  = degree of precision / sample error 7.5%. 10% of the estimated sample size was added to cater for missing records, and this brought the sample size to 187.

There were 60 health workers running the paediatrics departments. All health workers who had managed a child with diarrhoea and dehydration in the past 3 – 12 months prior to the study period were interviewed.

The medical records of all patients who had been admitted during the study period with acute diarrhoea were obtained. Children who met the inclusion criteria were included consecutively till the required sample size was met. Informed written consent was obtained.

All data were computerized, cleaned and corrected for outliers, and transferred into Microsoft Access database and then analysed using IBM-SPSS software version.

Ethical approval was provided by the Kenyatta National Hospital, University of Nairobi, Ethics and Research Committee, and the Directorate of Research and Planning, Ministry of Health of the Republic of South Sudan.

## Limitations

- It was not possible to verify whether or not the health worker documented every assessment he/she made.
- Some records may be lost, thus a 10% addition to the sample size was included to overcome this.
- Self-reported data is subject to recall and reporting biases.

## Results

The study examined 202 medical records of children admitted to TH with acute diarrhoea between March and June 2014. The majority (75.74%) of the children were 6-24 months old, 12.38% were 45-59 months old and 10.8% were 25-47 months old. The mean age was 14.79 months (SD: 11.22). There were 98 (52.9%) males and 87 (47.0%) females.

Co-morbidity was identified in 122 (60.40%) of the 202 patients. The most common was malaria with 90 cases (73.77%) followed by pneumonia with 24 cases (19.67%) and others (septicaemia and urinary tract infection).

The mean duration of diarrhoea was 3 days (SD=1.92) and the mean duration of vomiting was 3 days. (SD: 1.56). Documented clinical features of acute watery diarrhoea are presented in Table 1. Table 2 shows the classification by health workers of children according to their degree of dehydration.

Health workers' practices with regards to hydration fluid administration was assessed and the findings are in Table 3.

Thirty nine members of staff were interviewed to assess their knowledge of the management of acute diarrhoea to:

- ascertain their adherence to WHO guidelines and
- determine the adequacy of the facility and equipment availability for the management of acute diarrhoea.

Seventeen (41.3%) of the health workers interviewed were aged between 31 and 40 years; 29 (74.4%) were female and 10 (25.6%) were male. There were 2 (5.13%) consultants, 12 (30.8%) medical officers, 6 (15.4%) interns and 17 (43.6%) nurses. All the health workers interviewed had managed a child with acute diarrhoea but only 13 (33.3%) had had training in IMCI. Table 4 shows the knowledge of the health workers on the danger signs indicated in IMCI.

On the signs of dehydration, 37 (94.9%) of the health workers named sunken eyes, 35 (89.74%) skin pinch, 5 (12.82%) irritability and 25 (60.10%) other signs such as weight loss, dry mouth, sunken fontanel and dry skin.

## Discussion

This study sought to determine the level of adherence by health workers to the national guidelines on the diagnosis and treatment of acute watery diarrhoea in children. The majority of the children admitted to JTH with acute diarrhoea were aged between 6-24 months a finding similar to a study in Garissa, Kenya [7]. We found that the commonest sign assessed was sunken eyes and the least assessed was ability to drink/breastfeed, which was not the case in Garissa.

**Table 1. Clinical signs assessed by health workers and their findings (n=201 – 1 case file missing)**

Clinical sign	Assessed n (%)	Findings n (%)
Sunken eyes	151 (75.12%)	Present 108 (71.52%) Absent 43 (28.48%)
Skin pinch	111 (55.22%)	Immediate 53 (47.75%) Slow/prolonged 58 (52.25%)
Level of consciousness	124 (61.69%)	Alert 111 (91.12%) Altered consciousness 11 (8.87%)
Ability to drink/breastfeed	69 (34.32%)	Able to drink /breast feed 46 (66.67%) Unable to drink/breast feed 23 (33.33%).

The majority of patients were correctly classified according to WHO guidelines, much higher than the Garissa study despite the fact that the health workers there had been trained in IMCI and thus the expectation was that they would adhere better to the WHO guidelines.

Fluid management is key to the outcome of the children admitted for diarrhoea. Correct hydration fluid therapy was prescribed to? Less than half the patients-with no dehydration (43%), some dehydration (37%) and severe dehydration (20%) (from Table 3). Tanzanian study showed that 73.3% of patients with no dehydration or some dehydration had correct rehydration fluid administered [8]. This better performance in Tanzania could be due to the fact that 52% of the health workers had had training in IMCI while in JTH only 3.3% had been trained. There was also an inappropriate use of intravenous fluid (IVF) at JTH. IVF is more expensive than ORS, causes pain to the patients and requires closer monitoring which may be difficult when staffing numbers are low.

This study found that most patients without dehydration were not prescribed ORS, whereas all the patients with severe dehydration were given the correct fluids. In the Garissa study IVF was administered to 9% of the patients' dehydration and almost a third of the patients with a diagnosis of some dehydration [7]. This shows that health workers in JTH followed the guidelines in the management of severe dehydration.

One hundred and twenty two (60.40%) of our patients had a co-morbidity, malaria being the most common. This is similar to the Garissa study [7] where 80.6% had co-morbidity of which 54% had malaria. This study's findings could be due to the malaria endemicity in the country, whereas malaria is not endemic in Garissa.

Our health workers had some knowledge of the

**Table 2. Health worker classification of the degree of dehydration (n=198)**

Classification of dehydration	Health worker's classification of dehydration n %	Correct classification (Subset of number classified in column 1) n (%)
No dehydration	83 (41.91%)	70 (84.33%)
Some dehydration	62 (31.31%)	70 (84.33%)
Severe Dehydration	25 (12.63%)	22 (88%)
Other	28 (14.14%)	
Total		145 (75.68%)

management of acute diarrhoea on the background of their limited training in IMCI. Irritability was the least recognized sign of dehydration but knowledge about sunken eyes and skin pinch was good

An Ethiopian study [9] found that 54% health workers recognised shock as a feature of dehydration but our findings were much lower at 5.1%. Some of the patients were not classified using terms consistent with the guidelines which was disappointing given the IMCI teaching.

Despite many challenges, most, although not all, of the commodities needed for the management of acute diarrhoea were available at JTH.

## Conclusions

There was inadequate assessment and documentation by the health workers of the signs and symptoms of dehydration in the children admitted with acute watery diarrhoea compared to the WHO guidelines.

There was inappropriate use of rehydration fluid therapy compared to the WHO guidelines.

Apart from ORS and the IV fluids the supplies needed in the management of acute watery diarrhoea at the Juba Teaching Hospital were inadequate.

## Recommendations

1. Regular in-house training and feedback should be given to the clinicians and other health workers to improve the quality of care, particularly in the management of diarrhoea and its resultant dehydration.
2. Guidelines and protocols for the management of acute watery diarrhoea should be available and easily accessible in the wards and out-patient department.

**Table 3. Correct classification with the correct choice of hydration fluid according to WHO (n=103)**

Classification of dehydration	Correct choice of hydration fluid n (%)
No dehydration	44 (42.72%)
Some dehydration	38 (36.89%)
Severe Dehydration	21 (20.39%)

3. The commodities needed for the management of acute diarrhoea should be made available.

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**Table 4. Health workers' knowledge of danger signs**

Danger sign known by health worker	n	Percent %
A child with a change in conscious level/ irritability	7	17.95
A child who vomits everything	18	46.15
A child who is unable to drink or breastfeed	6	15.38
Child with convulsions	16	41.03
Don't know	12	30.77
Others	5	12.82